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The Administrative Record Staff

9527

# Internal Letter

Rockwell International

Date November 23, 1976

No.

TO Mr. E. Thompson
Address

FROM K. W. Calkins
Address

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Subject Review of Drum Field Data

On August 19, 1970, I submitted a report to L. M. Joshel that gave an estimate of 86 grams of plutonium that had leaked with oil into the soil at the "drum field." On September 15, 1970, a Status Report of Committee on Plutonium in Soil repeated this figure.

A review of my own records, of Rocky Flats Library records (Integrated Research File) and the workbooks of M. E. Maas has failed to reveal the exact manner in which this figure was calculated.

Several other related items were noted in the review, however. A report written by S. R. Pocsik on September 27, 1962, included a number of analyses of oil coolant-carbon tetrachloride mixture, which represented the major part of the plutonium-bearing oil in the field. These analyses included:

(a) $10^{-2}$ g/L (p. 18)

(b) $2 \times 10^{-2}$ g/L (p. 19)

(c) $1 \times 10^{-2}$ g/L (p. 19)

(d) $8 \times 10^{-4}$ g/L (p. 29)

(e) $4.0 \times 10^{-3}$ g/L (p. 31)

(f) $8.5 \times 10^{-3}$ g/L (p. 32)

The drum field contained 3574 drums of plutonium-bearing oil. Many of these were originally only partially filled. If, however, it were assumed that each contained 50 gals (189 litres) then a total of 676,000 litres of plutonium contaminated oil was present. Early estimates of plutonium concentration, made for design purposes, were conservatively set at $2 \times 10^{-2}$ g/L. The values given above indicate that $1 \times 10^{-2}$ or less would be a more realistic average. Based upon this number, approximately 6,760 grams of plutonium were present in the drum field at the maximum.

The oil processing records show that the following amounts were removed from the drum field (letter dated September 24, 1968 from M. E. Maas to K. V. Best):

| | | |
|---|---|---|
| caught on filters | - | 594 g |
| processed in oil | - | 2471 g |
| left in drums | - | 5152 g |
| Total | | 8217 g |

This amount was apparently greater than the amount originally present (6760 g). However, a significant part of the 8217 total came from "less than 1 gram" measurements from the drum counter, which were totalled as 1 gram. If the true value of these had averaged about 0.7 g, the results would have been about equal.

The 86 gram figure discussed earlier apparently was calculated by determining the average plutonium concentration in the oil that was processed (594 g + 2471 g / 178.600 gals = $1.72 \times 10^{-2}$ g / gal) and applying this to an estimate of 5,000 gals of oil that had leaked from the drums. It is not clear exactly how the 5,000 gal was determined, but the figure was reviewed by and appeared reasonable to a number of people then.

K. W. Calkins, Manager
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KWC:gw